

Title (en)

Polynucleotides encoding antigenic HIV type C polypeptides, polypeptides and uses thereof

Title (de)

Polynukleotide, die für antigene HIV-Polypeptide des C-Typs codieren, Polypeptide und ihre Verwendung

Title (fr)

Polynucléotides codant pour des polypeptides antigéniques du type C du VIH, de tels polypeptides et leurs utilisations

Publication

**EP 2281832 A2 20110209 (EN)**

Application

**EP 10173861 A 20010705**

Priority

- EP 01952426 A 20010705
- US 61031300 A 20000705

Abstract (en)

The present invention relates to polynucleotides encoding immunogenic HIV type C polypeptides. Uses of the polynucleotides in applications including DNA immunization, generation of packaging cell lines, and production of HIV Tyre C proteins are also described.

IPC 8 full level

**C07K 14/16** (2006.01); **C12N 15/09** (2006.01); **A61K 35/76** (2006.01); **A61K 38/00** (2006.01); **A61K 39/00** (2006.01); **A61K 39/21** (2006.01); **A61K 48/00** (2006.01); **A61P 31/12** (2006.01); **A61P 31/18** (2006.01); **C12N 1/15** (2006.01); **C12N 1/19** (2006.01); **C12N 1/21** (2006.01); **C12N 5/10** (2006.01)

CPC (source: EP US)

**A61P 31/12** (2018.01 - EP); **A61P 31/18** (2018.01 - EP); **A61P 37/04** (2018.01 - EP); **C07K 14/005** (2013.01 - EP US); **A61K 39/00** (2013.01 - EP US); **A61K 2039/53** (2013.01 - EP US); **C12N 2740/16122** (2013.01 - EP US); **C12N 2740/16222** (2013.01 - EP US); **C12N 2740/16322** (2013.01 - EP US)

Citation (applicant)

- WO 9630523 A2 19961003 - WOLF HANS [DE], et al
- EP 0449116 A1 19911002 - WOLF HANS JOACHIM PROF DR [DE]
- WO 9834640 A2 19980813 - MERCK & CO INC [US], et al
- US 5846546 A 19981208 - HURWITZ JULIA [US], et al
- US 5840313 A 19981124 - VAHLNE ANDERS [SE], et al
- US 5876731 A 19990302 - SIA CHARLES D Y [CA], et al
- WO 0039303 A2 20000706 - CHIRON CORP [US]
- US RE35749 E 19980317 - ROSENBERG STEVEN [US], et al
- US 5135855 A 19920804 - MOSS BERNARD [US], et al
- US 5629203 A 19970513 - SHUSTER JEFFREY R [US]
- WO 9014837 A1 19901213 - CHIRON CORP [US]
- WO 9313202 A1 19930708 - SCLAVO BIOCINE SPA [IT]
- WO 9219265 A1 19921112 - AMGEN INC [US], et al
- US 5142047 A 19920825 - SUMMERTON JAMES [US], et al
- US 5185444 A 19930209 - SUMMERTON JAMES E [US], et al
- US 5219740 A 19930615 - MILLER A DUSTY [US], et al
- GB 2200651 A 19880810 - AL SUMIDAIE AYAD MOHAMED KHALA
- EP 0415731 A2 19910306 - WELLCOME FOUND [GB]
- EP 0345242 A2 19891206 - SMITHKLINE BIOLOG [BE]
- WO 8902468 A1 19890323 - WHITEHEAD BIOMEDICAL INST [US], et al
- WO 8905349 A1 19890615 - UNIV AUSTRALIAN [AU], et al
- WO 8909271 A1 19891005 - VIAGENE INC [US]
- WO 9002806 A1 19900322 - WHITEHEAD BIOMEDICAL INST [US]
- WO 9007936 A1 19900726 - CHIRON CORP [US]
- WO 9403622 A1 19940217 - IMPERIAL COLLEGE [GB], et al
- WO 9325698 A1 19931223 - US GOV AS REPRESENTED BY THE [US]
- WO 9325234 A1 19931223 - UNIV CALIFORNIA [US]
- WO 9311230 A1 19930610 - DYNAL AS [NO]
- WO 9310218 A1 19930527 - US HEALTH [US], et al
- WO 9102805 A2 19910307 - VIAGENE INC [US]
- US 4405712 A 19830920 - VANDE WOUDE GEORGE F [US], et al
- US 4861719 A 19890829 - MILLER A DUSTY [US]
- US 4980289 A 19901225 - TEMIN HOWARD M [US], et al
- US 4777127 A 19881011 - SUNI JUKKA [FI], et al
- US 80092191 A 19911127
- US 4738927 A 19880419 - TANIGUCHI TADATSUGU [JP], et al
- US 5326859 A 19940705 - SUGANO HARUO [JP], et al
- US 4853332 A 19890801 - MARK DAVID F [US], et al
- US 4847201 A 19890711 - KASWASAKI ERNEST S [US], et al
- US 4879227 A 19891107 - CLARK STEVEN C [US], et al
- US 9402951 W 19940317
- US 5017691 A 19910521 - LEE FRANK [US], et al
- WO 9006370 A1 19900614 - UNIV NORTH CAROLINA [US], et al
- US 4965195 A 19901023 - NAMEN ANTHONY E [US], et al
- US 4892743 A 19900109 - LEIBOWITZ PAUL J [US], et al
- US 4966843 A 19901030 - MCCORMICK FRANCIS P [US], et al
- WO 8502862 A1 19850704 - UNIV MONASH [AU], et al
- US 4762791 A 19880809 - GOEDDEL DAVID V [US], et al
- US 4727138 A 19880223 - GOEDDEL DAVID V [US], et al

- US 4999291 A 19910312 - SOUZA LAWRENCE M [US]
- US 4810643 A 19890307 - SOUZA LAWRENCE M [US]
- WO 8504188 A1 19850926 - RESEARCH CORP [US]
- WO 9402951 A1 19940203 - UNIV NEW YORK [US]
- WO 9621015 A2 19960711 - VIAGENE INC [US]
- US 4683202 A 19870728 - MULLIS KARY B [US]
- US 4683195 A 19870728 - MULLIS KARY B [US], et al
- US 4800159 A 19890124 - MULLIS KARY B [US], et al
- US 5399346 A 19950321 - ANDERSON W FRENCH [US], et al
- US 5580859 A 19961203 - FELGNER PHILIP L [US], et al
- US 5589466 A 19961231 - FELGNER PHILIP L [US], et al
- US 5173414 A 19921222 - LEBKOWSKI JANE S [US], et al
- US 5139941 A 19920818 - MUZYCZKA NICHOLAS [US], et al
- WO 9201070 A1 19920123 - US HEALTH [US]
- WO 9303769 A1 19930304 - US HEALTH [US]
- US 5676950 A 19971014 - SMALL JR PARKER A [US], et al
- WO 9112882 A1 19910905 - MEDGENIX GROUP SA [BE]
- WO 8903429 A1 19890420 - HEALTH RESEARCH INC [US]
- WO 9203545 A1 19920305 - VIROGENETICS CORP [US]
- WO 9507995 A2 19950323 - APPLIED IMMUNESCIENCES [US]
- WO 9617072 A2 19960606 - VIAGENE INC [US]
- US 5843723 A 19981201 - DUBENSKY JR THOMAS W [US], et al
- US 5789245 A 19980804 - DUBENSKY JR THOMAS W [US], et al
- WO 9426911 A1 19941124 - UNIV OHIO [US]
- WO 9011092 A1 19901004 - VICAL INC [US], et al
- US 4663161 A 19870505 - MANNINO RAPHAEL J [US], et al
- US 4871488 A 19891003 - MANNINO RAPHAEL J [US], et al
- US 9917308 W 19990729
- US 5831005 A 19981103 - ZUCKERMAN RONALD N [US], et al
- US 4945050 A 19900731 - SANFORD JOHN C [US], et al
- US 5036006 A 19910730 - SANFORD JOHN C [US], et al
- US 5100792 A 19920331 - SANFORD JOHN C [US], et al
- US 5179022 A 19930112 - SANFORD JOHN C [US], et al
- US 5371015 A 19941206 - SANFORD JOHN C [US], et al
- US 5478744 A 19951226 - SANFORD JOHN C [US], et al
- WO 9738087 A2 19971016 - VIAGENE INC [US], et al
- BARRE-SINOUSSI ET AL., SCIENCE, vol. 220, 1983, pages 868 - 871
- MONTAGNIER ET AL.: "Human T-Cell Leukemia Viruses", 1984
- VILMER ET AL., THE LANCET, vol. 1, 1984, pages 753
- POPOVIC ET AL., SCIENCE, vol. 224, 1984, pages 497 - 500
- LEVY ET AL., SCIENCE, vol. 225, 1984, pages 840 - 842
- GUYADER ET AL., NATURE, vol. 326, 1987, pages 662 - 669
- BRUN-VEZINET ET AL., SCIENCE, vol. 233, 1986, pages 343 - 346
- CLAVEL ET AL., NATURE, vol. 324, 1986, pages 691 - 695
- HAAS ET AL., CURRENT BIOLOGY, vol. 6, no. 3, 1996, pages 315 - 324
- ANDRE ET AL., J. VIROL., vol. 72, no. 2, 1998, pages 1497 - 1503
- SCHNEIDER ET AL., J. VIROL., vol. 71, no. 7, 1997, pages 4892 - 4903
- FREED, E.O., VIROLOGY, vol. 251, 1998, pages 1 - 15
- WANG ET AL., VIROLOGY, vol. 200, 1994, pages 524 - 534
- "Remington's Pharmaceutical Sciences, 18th Edition", 1990, MACK PUBLISHING COMPANY
- S. COLOWICK AND N. KAPLAN, EDS.: "Methods In Enzymology", ACADEMIC PRESS, INC.
- D.M. WEIR AND C.C. BLACKWELL, EDS.: "Handbook of Experimental Immunology", vol. I-IV, 1986, BLACKWELL SCIENTIFIC PUBLICATIONS
- SAMBROOK ET AL.: "Molecular Cloning: A Laboratory Manual, 2nd Edition", 1989
- AUSUBEL ET AL.: "Short Protocols in Molecular Biology, 4th ed.", 1999, JOHN WILEY & SONS
- REAM ET AL.: "Molecular Biology Techniques: An Intensive Laboratory Course", 1998, ACADEMIC PRESS
- NEWTON & GRAHAM: "PCR (Introduction to Biotechniques Series), 2nd ed.", 1997, SPRINGER VERLAG
- BAKER ET AL., BIOPHYS. J., vol. 60, 1991, pages 1445 - 1456
- HAGENSEE ET AL., J. VIROL., vol. 68, 1994, pages 4503 - 4505
- ERICKSON ET AL., J. IMMUNOL., vol. 151, 1993, pages 4189 - 4199
- DOE ET AL., EUR. J. IMMUNOL., vol. 24, 1994, pages 2369 - 2376
- MCMICHAEL, A.J.; O'CALLAGHAN, C.A., J. EXP. MED., vol. 187, no. 9, 1998, pages 1367 - 1371
- MCHEYZER-WILLIAMS, M.G. ET AL., IMMUNOL. REV., vol. 150, 1996, pages 5 - 21
- LALVANI, A. ET AL., J. EXP. MED., vol. 186, 1997, pages 859 - 865
- SMITH; WATERMAN, ADVANCES IN APPLIED MATHEMATICS, vol. 2, 1981, pages 482 - 489
- DAYHOFF: "Atlas of Protein Sequences and Structure", vol. 5, pages: 353 - 358
- GRIBSKOV, NUCL. ACIDS RES., vol. 14, no. 6, 1986, pages 6745 - 6763
- ANONYMUS: "Wisconsin Sequence Analysis Package Program Manual.Version 8", 1995
- B.D. HAMES AND S.J. HIGGINS: "Nucleic Acid Hybridization: A Practical Approach", 1985, IRL PRESS
- GRAHAM ET AL., VIROLOGY, vol. 52, 1973, pages 456
- SAMBROOK ET AL.: "Molecular Cloning, a laboratory manual", 1989, COLD SPRING HARBOR LABORATORIES
- DAVIS ET AL.: "Basic Methods in Molecular Biology", 1986, ELSEVIER
- CHU ET AL., GENE, vol. 13, 1981, pages 197
- MOOLTEN, F.L., CANCER GENE THER., vol. 1, 1994, pages 279 - 287
- MANOME ET AL., GENE THERAPY, vol. 3, 1996, pages 513 - 520
- MANOME ET AL., NATURE MEDICINE, vol. 2, no. 5, 1996, pages 567 - 573
- DONG ET AL., HUMAN GENE THERAPY, vol. 7, 1996, pages 713 - 720
- CULVER ET AL., SCIENCE, vol. 256, 1992, pages 1550 - 1552
- HUBER ET AL., PROC. NATL. ACAD. SCI. USA, vol. 91, 1994, pages 8302 - 8306
- W.K. JOKLIK: "Virology, 3rd Edition", 1988
- B.N. FIELDS AND D.M. KNIPE: "Fundamental Virology, 2nd Edition", 1991
- FIELDS, BN, DM KNIPE, PM HOWLEY, "Virology, 3rd Edition", 1996, LIPPINCOTT-RAVEN
- KORBER ET AL.: "Human Retroviruses and Aids", 1998, LOS ALAMOS NATIONAL LABORATORY
- NOVITSKY ET AL., J. VIROL., vol. 73, no. 5, 1999, pages 4427 - 4432

- FIELDS, BN, DM KNIPE, PM HOWLEY,: "Virology, 3rd Edition", 1996, LIPPINCOTT-RAVEN
- WAN ET AL., BIOCHEM. J., vol. 316, 1996, pages 569 - 573
- KOHL ET AL., PNAS USA, vol. 85, 1988, pages 4686 - 4690
- KRAUSSLICH ET AL., J VIROL., vol. 62, 1988, pages 4393 - 4397
- COFFIN: "Virology", 1990, RAVEN, article "Retroviridae and their Replication", pages: 1437 - 1500
- PATEL, BIOCHEMISTRY, vol. 34, 1995, pages 5351 - 5363
- NOVITSKY ET AL., J VIROL., vol. 73, no. 5, 1999, pages 4427 - 4432
- MCCOMACK ET AL., FEBS LETTS, vol. 414, 1997, pages 84 - 88
- PARK ET AL., J. VIROL., vol. 65, 1991, pages 5111
- PATEL ET AL., BIOCHEM., vol. 34, 1995, pages 5351
- PALANIAPPAN ET AL., J. BIOL. CHEM., vol. 272, no. 17, 1997, pages 11157
- MYERS ET AL.: "Los Alamos Database", 1992, LOS ALAMOS NATIONAL LABORATORY
- MYERS ET AL., HUMAN RETROVIRUSES AND AIDS, 1997
- CHAPMAN ET AL., NUC. ACIDS RES., vol. 19, 1991, pages 3979 - 3986
- DIJKEMA ET AL., EMBO J, vol. 4, 1985, pages 761
- GERMAN ET AL., PROC. NATL. ACAD. SCI. USA, vol. 79, 1982, pages 6777
- BOSHART ET AL., CELL, vol. 41, 1985, pages 521
- REILLY, P.R. ET AL., BACULOVIRUS EXPRESSION VECTORS: A LABORATORY MANUAL, 1992
- BEAMES ET AL., BIOTECHNIQUES, vol. 11, 1991, pages 378
- EARL, P. L. ET AL.: "Current Protocols in Molecular Biology", 1991, GREENE PUBLISHING ASSOCIATES & WILEY INTERSCIENCE, article F. M. AUSUBEL, ET AL.: "Expression of proteins in mammalian cells using vaccinia"
- AUSUBEL, F.M. ET AL.: "CURRENT PROTOCOLS IN MOLECULAR BIOLOGY", JOHN WILEY AND SONS, INC.
- GELLISSEN, G. ET AL., ANTONIE VAN LEEUWENHOEK, vol. 62, no. 1-2, 1992, pages 79 - 93
- ROMANOS, M.A. ET AL., YEAST, vol. 8, no. 6, 1992, pages 423 - 488
- GOEDEL, D.V., METHODS IN ENZYMOLOGY, vol. 185, 1990
- GUTHRIE, C.; G.R. FINK, METHODS IN ENZYMOLOGY, vol. 194, 1991
- HAYNES, J. ET AL., NUC. ACID. RES., vol. 11, 1983, pages 687 - 706
- LAU, Y.F. ET AL., MOL. CELL. BIOL., vol. 4, 1984, pages 1469 - 1475
- KAUFMAN, R. J.: "Methods in Enzymology", vol. 185, 1991, ACADEMIC PRESS, INC., article "Selection and coamplification of heterologous genes in mammalian cells", pages: 537 - 566
- "plant cloning vectors", CLONTECH LABORATORIES, INC
- "Pharmacia LKB", BIOTECHNOLOGY, INC.
- HOOD, E. ET AL., J: BACTERIOL., vol. 168, 1986, pages 1291 - 1301
- NAGEL, R. ET AL., FEMS MICROBIOL. LETT., vol. 67, 1990, pages 325
- AN ET AL.: "Plant Molecular Biology Manual A3", 1988, article "Binaiy Vectors", pages: 1 - 19
- MIKI, B.L.A. ET AL.: "Plant DNA Infectious Agents", 1987, SPRINGER-VERLAG, pages: 249 - 265
- P.G. JONES; J.M. SUTTON: "Plant Molecular Biology: Essential Techniques", 1997, J. WILEY
- MIGLANI: "Gurbachan Dictionary of Plant Genetics and Molecular Biology", 1998, FOOD PRODUCTS PRESS
- HENRY, R. J.: "Practical Applications of Plant Molecular Biology", 1997, CHAPMAN & HALL
- KOZAK, M., MAMM. GENOME, vol. 7, no. 8, 1996, pages 563 - 574
- KOZAK, M., BIOCHIMIE, vol. 76, no. 9, 1994, pages 815 - 821
- KOZAK, M., J CELL BIOL, vol. 108, no. 2, 1989, pages 229 - 241
- KOZAK, M.; SHATKIN, A.J., METHODS ENZYMOL, vol. 60, 1979, pages 360 - 375
- TOMEI ET AL., J. VIROL., vol. 67, 1993, pages 4017 - 4026
- SELBY ET AL., J. GEN. VIROL., vol. 74, 1993, pages 1103 - 1113
- STUDIER; MOFFATT, J. MOL. BIOL., vol. 189, 1986, pages 113 - 130
- E.L.V. HAMS AND S. ANGAL,: "Protein Purification Applications: A Practical Approach", 1990
- KIMBAUER ET AL., J. VIROL., vol. 67, 1993, pages 6929 - 6936
- JEFFERY ET AL., PHARM. RES., vol. 10, 1993, pages 362 - 368
- MCGEE JP ET AL., J MICROENCAPSUL., vol. 14, no. 2, 1997, pages 197 - 210
- O'HAGAN DT ET AL., VACCINE, vol. 11, no. 2, 1993, pages 149 - 54
- DAVIS, H.L. ET AL., J. IMMUNOLOGY, vol. 160, 1998, pages 870 - 876
- SATO, Y. ET AL., SCIENCE, vol. 273, 1996, pages 352 - 354
- PITHA, BIOCHEM BIOPHYS ACTA, vol. 204, 1970, pages 39
- PITHA, BIOPOLYMERS, vol. 9, 1970, pages 965
- MILLER ET AL., BIOTECHNIQUES, vol. 7, 1989, pages 980
- MILLER, A.D., HUMAN GENE THERAPY, vol. 1, 1990, pages 5
- SCARPA ET AL., VIROLOGY, vol. 180, 1991, pages 849
- BUMS ET AL., PROC. NATL. ACAD. SCI. USA, vol. 90, 1993, pages 8033
- BORIS-LAWRIE ET AL., CUR. OPIN. GENET. DEVELOP., vol. 3, 1993, pages 102
- VILE, CANCER RES, vol. 53, 1993, pages 3860 - 3864
- VILE, CANCER RES, vol. 53, 1993, pages 962 - 967
- RAM, CANCER RES, vol. 53, 1993, pages 83 - 88
- TAKAMIYA, J NEUROSCI RES, vol. 33, 1992, pages 493 - 503
- BABA, J NEUROSURG, vol. 79, 1993, pages 729 - 735
- MANN, CELL, vol. 33, 1983, pages 153
- CANE, PROC NATL ACAD SCI USA, vol. 81, 1984, pages 6349
- MILLER, HUMAN GENE THERAPY, 1990, pages 1
- KARUPIAH ET AL., J. IMMUNOLOGY, vol. 144, 1990, pages 290 - 298
- WEBER ET AL., EXP. MED., vol. 166, 1987, pages 1716 - 1733
- GANSBACHER ET AL., J: EXP. MED., vol. 172, 1990, pages 1217 - 1224
- TEPPER ET AL., CELL, vol. 57, 1989, pages 503 - 512
- GOLUMBEK ET AL., SCIENCE, vol. 254, 1991, pages 713 - 716
- BRAKENHOF ET AL., J. IMMUNOL., vol. 139, 1987, pages 4116 - 4121
- FINTER ET AL., DRUGS, vol. 42, 1991, pages 749 - 765
- NAGATA ET AL., NATURE, vol. 284, 1980, pages 316 - 320
- FAMILLETTI ET AL., METHODS IN ENZ., vol. 78, 1981, pages 387 - 394
- TWU ET AL., PROC. NATL. ACAD. SCI. USA, vol. 86, 1989, pages 2046 - 2050
- FAKTOR ET AL., ONCOGENE, vol. 5, 1990, pages 867 - 872
- SEIF ET AL., J. VIROL., vol. 65, 1991, pages 664 - 671
- RADFORD ET AL., THE AMERICAN SOCIETY OF HEPATOLOGY, 1991, pages 20082015
- WATANABE ET AL., PROC. NATL. ACAD. SCI. USA, vol. 86, 1989, pages 9456 - 9460
- GANSBACHER ET AL., CANCER RESEARCH, vol. 50, 1990, pages 7820 - 7825

- MAIO ET AL., CAN. IMMUNOL IMMUNOTHER., vol. 30, 1989, pages 34 - 42
- AUSBEL ET AL.: "Current Protocols in Molecular Biology", GREENE PUBLISHING AND WILEY-INTERSCIENCE
- ERLICH: "PCR Technology: Principles and Applications for DNA Amplification", 1989, STOCKTON PRESS
- EDGE, NATURE, vol. 292, 1981, pages 756
- NAMBAIR ET AL., SCIENCE, vol. 223, 1984, pages 1299
- JAY ET AL., J. BIOL. CHEM., vol. 259, 1984, pages 6311
- MANN ET AL., CELL, vol. 33, 1993, pages 153
- MULLIGAN, PROC. NAT'L. ACAD. SCI. USA, vol. 81, 1984, pages 6349
- MILLER ET AL., HUMAN GENE THERAPY, vol. 1, 1990, pages 5 - 14
- ANDRE, S. ET AL., JOURNAL OF VIROLOGY, vol. 72, no. 2, 1998, pages 1497 - 1503
- HAAS, J. ET AL., CURRENT BIOLOG, vol. 6, no. 3, 1996, pages 315 - 324
- "RNA Tumor Viruses, Second Edition", 1985, COLD SPRING HARBOR LABORATORY
- OGERT ET AL., J VIROL., vol. 70, 1996, pages 3834 - 3843
- LIU; MERTZ, GENES & DEV., vol. 9, 1995, pages 1766 - 1789
- ZOLOTUKHIN ET AL., J VIROL., vol. 68, no. 7, 1994, pages 944 - 7952
- KEDES, ANNU. REV. BIOCHEM., vol. 48, 1970, pages 837 - 870
- NAGATA ET AL., NATURE, vol. 287, 1980, pages 401 - 408
- KOILKA ET AL., NATURE, vol. 329, 1987, pages 75 - 79
- HATTORIE ET AL., PROC. NATL. ACAD. SCI. USA, vol. 85, 1988, pages 9148 - 9152
- LEVIN ET AL., GENE, vol. 108, 1991, pages 167 - 174
- MYERS ET AL., HUMAN RETROVIRUSES AND AIDS, 1990
- JAY ET AL., J. BIOL. CHEM., vol. 259, 1984, pages 6311
- STEMMER, W.P.C., GENE, vol. 164, 1995, pages 49 - 53
- WAGNER, R. ET AL., ARCH VIROL., vol. 127, 1992, pages 117 - 137
- WAGNER, R. ET AL., VIROLOGY, vol. 200, 1994, pages 162 - 175
- WU, X. ET AL., J. VIROL., vol. 69, no. 6, 1995, pages 3389 - 3398
- WANG, C-T. ET AL., VIROLOGY, vol. 200, 1994, pages 524 - 534
- CHAZAL, N. ET AL., VIROLOGY, vol. 68, no. 1, 1994, pages 111 - 122
- GRIFFITHS, J.C. ET AL., J. VIROL., vol. 67, no. 6, 1993, pages 3191 - 3198
- REICIN, A.S. ET AL., J. VIROL., vol. 69, no. 2, 1995, pages 642 - 650
- BORSETTI, A. ET AL., J. VIROL., vol. 72, no. 11, 1998, pages 9313 - 9317
- GAMIER, L. ET AL., J VIROL, vol. 72, no. 6, 1998, pages 4667 - 4677
- ZHANG, Y. ET AL., J VIROL, vol. 72, no. 3, 1998, pages 1782 - 1789
- WANG, C. ET AL., J VIROL, vol. 72, no. 10, 1998, pages 7950 - 7959
- DIJKEMA ET AL., EMBO J., vol. 4, 1985, pages 761
- GORMAN ET AL., PROC. NATL. ACAD. SCI. USA, vol. 79, 1982, pages 6777
- MILLER; ROSMAN, BIOTECHNIQUES, vol. 7, 1989, pages 980 - 990
- MILLER, A.D., HUMAN GENE THERAPY, vol. 1, 1990, pages 5 - 14
- SCARPA ET AL., VIROLOGY, vol. 180, 1991, pages 849 - 852
- BUMS ET AL., PROC. NATL. ACAD. SCI. USA, vol. 90, 1993, pages 8033 - 8037
- BORIS-LAWRIE; TEMIN, CUR. OPIN. GENET. DEVELOP., vol. 3, 1993, pages 102 - 109
- HAJ-AHMAD; GRAHAM, J. VIROL., vol. 57, 1986, pages 267 - 274
- BETT ET AL., J. VIROL., vol. 67, 1993, pages 5911 - 5921
- MITTEREDER ET AL., HUMAN GENE THERAPY, vol. 5, 1994, pages 717 - 729
- SETH ET AL., J VIROL., vol. 68, 1994, pages 933 - 940
- BARR ET AL., GENE THERAPY, vol. 1, 1994, pages 51 - 58
- BERKNER, K.L., BIOTECHNIQUES, vol. 6, 1988, pages 616 - 629
- RICH ET AL., HUMAN GENE THERAPY, vol. 4, 1993, pages 461 - 476
- LEBKOWSKI ET AL., MOLEC. CELL. BIOL., vol. 8, 1988, pages 3988 - 3996
- VINCENT ET AL.: "Vaccines", vol. 90, 1990, COLD SPRING HARBOR LABORATORY PRESS
- CARTER, B.J., CURRENT OPINION IN BIOTECHNOLOGY, vol. 3, 1992, pages 533 - 539
- MUZYCZKA, N., CURRENT TOPICS IN MICROBIOL. AND IMMUNOL., vol. 158, 1992, pages 97 - 129
- KOTIN, R.M., HUMAN GENE THERAPY, vol. 5, 1994, pages 793 - 801
- SHELLING; SMITH, GENE THERAPY, vol. 1, 1994, pages 165 - 169
- ZHOU ET AL., J. EXP. MED., vol. 179, 1994, pages 1867 - 1875
- MICHAEL ET AL., J.BIOL. CHEM., vol. 268, 1993, pages 6866 - 6869
- WAGNER ET AL., PROC. NATL. ACAD. SCI. USA, vol. 89, 1992, pages 6099 - 6103
- DUBENSKY ET AL., J VIROL., vol. 70, 1996, pages 508 - 519
- ELROY-STEIN; MOSS, PROC. NATL. ACAD. SCI. USA, vol. 87, 1990, pages 6743 - 6747
- FUERST ET AL., PROC. NATL. ACAD. SCI. USA, vol. 83, 1986, pages 8122 - 8126
- STUDIER; MOFFATT, J MOL. BIOL., vol. 189, 1986, pages 113 - 130
- DENG; WOLFF, GENE, vol. 143, 1994, pages 245 - 249
- GAO ET AL., BIOCHEM. BIOPHYS. RES. COMMUN., vol. 200, 1994, pages 1201 - 1206
- GAO; HUANG, NUC. ACIDS RES., vol. 21, 1993, pages 2867 - 2872
- CHEN ET AL., NUC. ACIDS RES., vol. 22, 1994, pages 2114 - 2120
- HUG; SLEIGHT, BIOCHIM. BIOPHYS. ACTA, vol. 1097, 1991, pages 1 - 17
- STRAUBINGER ET AL., METHODS OF ENZYMOLOGY, vol. 101, 1983, pages 512 - 527
- FELGNER ET AL., PROC. NATL. ACAD. SCI. USA, vol. 84, 1987, pages 7413 - 7416
- MALONE ET AL., PROC. NATL. ACAD. SCI. USA, vol. 86, 1989, pages 6077 - 6081
- DEBS ET AL., J. BIOL. CHEM., vol. 265, 1990, pages 10189 - 10192
- FELGNER ET AL., PROC. NATL. ACAD. SCI. USA, vol. 84, 1987, pages 7413 - 7416
- SZOKA ET AL., PROC. NATL. ACAD. SCI. USA, vol. 75, 1978, pages 4194 - 4198
- STRAUBINGER ET AL., METHODS OF IMMUNOLOGY, vol. 101, 1983, pages 512 - 527
- PAPAHAJDOPOULOS ET AL., BIOCHIM. BIOPHYS. ACTA, vol. 394, 1975, pages 483
- WILSON ET AL., CELL, vol. 17, 1979, pages 77
- DEAMER; BANGHAM, BIOCHIM. BIOPHYS. ACTA, vol. 443, 1976, pages 629
- OSTRO ET AL., BIOCHEM. BIOPHYS. RES. COMMUN., vol. 76, 1977, pages 836
- FRALEY ET AL., PROC. NATL. ACAD. SCI. USA, vol. 76, 1979, pages 3348
- ENOCH; STRITTMATTER, PROC. NATL. ACAD. SCI. USA, vol. 76, 1979, pages 145
- FRALEY ET AL., J BIOL. CHEM., vol. 255, 1980, pages 10431
- SZOKA; PAPAHAJDOPOULOS, PROC. NATL. ACAD. SCI. USA, vol. 75, 1978, pages 145
- SCHAEFER-RIDDER ET AL., SCIENCE, vol. 215, 1982, pages 166
- PAPAHAJDOPOULOS ET AL., BIOCHEM. BIOPHYS. ACTA., vol. 394, 1975, pages 483 - 491

- FELGNER, PL., ADVANCED DRUG DELIVERY REVIEWS, vol. 1, 1990, pages 163 - 187
- DAVIS, H.L. ET AL.: "Vaccine", vol. 12, 1994, BIOJECT, INC., pages: 1503 - 1509
- WILSON, J. INFECT. DIS., vol. 172, 1995, pages 88
- NOLTA ET AL., EXP. HEMATOL., vol. 20, 1992, pages 1065
- SCHNEIDER R ET AL., J VIROL., vol. 71, no. 7, 1997, pages 4892 - 4903
- "The Retroviridae", 1995, PLENUM PRESS, pages: 215 - 20
- GRIMISON, B.; LAURENCE, J., JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES AND HUMAN RETROVIROLOGY, vol. 9, no. 1, 1995, pages 58 - 68
- WAKEFIELD, J. K., JOURNAL OF VIROLOGY, vol. 66, no. 11, 1992, pages 6806 - 6812
- ESNOUF, R., NATURE STRUCTURAL BIOLOGY, vol. 2, no. 4, 1995, pages 303 - 308
- MAIGNAN, S. ET AL., JOURNAL OF MOLECULAR BIOLOGY, vol. 282, no. 2, 1998, pages 359 - 368
- KATZ, R. A.; SKALKA, A. M., ANNUAL REVIEW OF BIOCHEMISTRY, vol. 73, 1994
- JACOBO-MOLINA, A. ET AL., PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 90, no. 13, 1993, pages 6320 - 6324
- HICKMAN, A. B. ET AL., JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 269, no. 46, 1994, pages 29279 - 29287
- GOLDGUR, Y. ET AL., PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 95, no. 16, 1998, pages 9150 - 9154
- GOETTE, M. ET AL., JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 273, no. 17, 1998, pages 10139 - 10146
- GORTON, J. L. ET AL., JOURNAL OF VIROLOGY, vol. 72, no. 6, 1998, pages 5046 - 5055
- ENGELMAN, A. ET AL., JOURNAL OF VIROLOGY, vol. 71, no. 5, 1997, pages 3507 - 3514
- DYDA, F. ET AL., SCIENCE, vol. 266, no. 5193, pages 1981 - 1986
- DAVIES, J. F. ET AL., SCIENCE, vol. 252, no. 5002, 1991, pages 88 - 95
- BUJACZ, G. ET AL., FEBS LETTERS, vol. 398, no. 2-3, 1996, pages 175 - 178
- BEARD, W. A. ET AL., JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 271, no. 21, 1996, pages 12213 - 12220
- KOHLSTAEDT, L. A. ET AL., SCIENCE, vol. 256, no. 5065, 1992, pages 1783 - 1790
- KRUG, M. S.; BERGER, S. L., BIOCHEMISTRY, vol. 30, no. 44, 1991, pages 10614 - 10623
- MAZUMDER, A. ET AL., MOLECULAR PHARMACOLOGY, vol. 49, no. 4, 1996, pages 621 - 628
- PALANIAPPAN, C. ET AL., JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 272, no. 17, 1997, pages 11157 - 11164
- RODGERS, D. W ET AL., PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 92, no. 4, 1995, pages 1222 - 1226
- SHENG, N.; DENNIS, D., BIOCHEMISTRY, vol. 32, no. 18, 1993, pages 4938 - 4942
- SPENCE, R. A. ET AL., SCIENCE, vol. 267, no. 5200, 1995, pages 988 - 993
- MUNEMITSU S. ET AL., MOL CELL BIOL., vol. 10, 1990, pages 5977 - 5982
- BORSETTI, A. ET AL., J VIROL., vol. 72, no. 11, 1998, pages 9313 - 9317
- MAMMANO, F. ET AL., J VIROL., vol. 68, no. 8, 1994, pages 4927 - 4936
- DUBENSKY ET AL., J VIROL., vol. 70, 1996, pages 508 - 519

#### Citation (examination)

- WO 0026416 A1 20000511 - UAB RESEARCH FOUNDATION [US]
- GAO FENG ET AL: "A comprehensive panel of near-full-length clones and reference sequences for non-subtype B isolates of human immunodeficiency virus type 1", JOURNAL OF VIROLOGY, THE AMERICAN SOCIETY FOR MICROBIOLOGY, US, vol. 72, no. 7, 1 July 1998 (1998-07-01), pages 5680 - 5698, XP002318558, ISSN: 0022-538X

#### Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

#### DOCDB simple family (publication)

**WO 0204493 A2 20020117; WO 0204493 A3 20030626;** AT E478955 T1 20100915; AU 7317901 A 20020121; CA 2414374 A1 20020117; CA 2414374 C 20140121; DE 60142922 D1 20101007; EP 1339738 A2 20030903; EP 1339738 B1 20100825; EP 2281832 A2 20110209; EP 2281832 A3 20111214; EP 2311958 A2 20110420; EP 2311958 A3 20110810; EP 2311958 B1 20150819; ES 2553575 T3 20151210; JP 2004502445 A 20040129; JP 2012147792 A 20120809; US 2003223961 A1 20031204; US 2010316698 A1 20101216; US 2011212164 A1 20110901; US 7618642 B2 20091117; US 7935805 B1 20110503; ZA 200300839 B 20040730; ZA 200403143 B 20050426

#### DOCDB simple family (application)

**US 0121241 W 20010705;** AT 01952426 T 20010705; AU 7317901 A 20010705; CA 2414374 A 20010705; DE 60142922 T 20010705; EP 01952426 A 20010705; EP 10173861 A 20010705; EP 10183206 A 20010705; ES 10183206 T 20010705; JP 2002509356 A 20010705; JP 2012076530 A 20120329; US 201113099219 A 20110502; US 61031300 A 20000705; US 62051109 A 20091117; US 89957501 A 20010705; ZA 200300839 A 20030130; ZA 200403143 A 20010423